NASA TECH BRIEF

Braze Alloy Holds Bonding Strength over Wide Temperature Range

The problem:

To develop a braze alloy for vacuum furnace brazing of large stainless steel components at a maximum temperature of 1975°F. The alloy was required to have high bonding strength and good ductility over a temperature range extending from the cryogenic region to approximately 800°F and to be relatively insensitive to joint clearance variations. Although a commercially available copper–gold alloy essentially meets these requirements, its relatively high gold content makes its cost prohibitive for brazing of large structures.

The solution:

A series of copper-based quaternary alloys of the solid solution type. Although each of the alloys in this series contains palladium, the proportions of this noble metal used (up to 10 percent by weight) cost considerably less than the gold (35 percent by weight) used in the commercial alloy. Two typical alloys, designated AGC-202A and AGC-204B, in this series have the following range of compositions in percent by weight:

	AGC-202A	AGC-204B
Silicon	3.5–4.0	1.5–2.0
Palladium	0.5–1.0	5.0–6.0
Nickel	0.5–1.5	3.3–4.0
Copper	Balance	Balance

Alloy AGC-202A has a liquidus temperature of 1875°F and a brazing temperature of 1900°F. The respective values for alloy AGC-204B are 1925°F and 1975°F.

Notes:

1. These alloys can be made in the form of wire, foil, or powder.
2. Although developed primarily for use as braze metals, these alloys may be considered as a construction material in applications where critical vapor pressures are important.
3. Inquiries covering this innovation may be directed to:

   Technology Utilization Officer
   Lewis Research Center
   21000 Brookpark Road
   Cleveland, Ohio 44135
   Reference: B66-10519

Patent status:

No patent action is contemplated by NASA.

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